IN THE CLAIMS

Please amend the claims as follows:

1-37. (Canceled).

38. (Previously Presented) A microprocessor comprising:

a register to store a register value corresponding to a threshold temperature;

a programmable thermal sensor to receive the register value, wherein the programmable thermal sensor is to generate a first interrupt signal in response to a microprocessor temperature exceeding the threshold temperature corresponding to the register value;

clock circuitry to provide a clock signal for the microprocessor;

a processor unit coupled to the clock circuitry, wherein the processor unit is to execute instructions to vary the frequency of the clock signal in response to the first interrupt signal; and

a fail-safe thermal sensor to generate a fail-safe interrupt signal in response to the microprocessor temperature exceeding a fail-safe threshold temperature, wherein the processor unit is halted in response to the fail-safe interrupt signal.

39. (Previously Presented) A microprocessor comprising:

a register to store a register value corresponding to a threshold temperature;

a programmable thermal sensor to receive the register value, wherein the programmable thermal sensor is to generate a first interrupt signal in response to a microprocessor temperature exceeding the threshold temperature corresponding to the register value;

clock circuitry to provide a clock signal for the microprocessor; and

a processor unit coupled to the clock circuitry, wherein the processor unit is to execute instructions to vary the frequency of the clock signal in response to the first interrupt signal; wherein the clock circuitry further comprises a phase locked loop.

40. (Previously Presented) A microprocessor comprising:

a register to store a register value corresponding to a threshold temperature;

a programmable thermal sensor to receive the register value, wherein the programmable thermal sensor is to generate a first interrupt signal in response to a microprocessor temperature exceeding the threshold temperature corresponding to the register value;

clock circuitry to provide a clock signal for the microprocessor; and

a processor unit coupled to the clock circuitry, wherein the processor unit is to execute instructions to vary the frequency of the clock signal in response to the first interrupt signal;

wherein the thermal sensor comprises

a current source;

a voltage reference coupled to the current source to provide a bandgap reference voltage, wherein the bandgap reference voltage is substantially constant over a range of temperatures;

programmable circuitry to provide an output voltage varying with the microprocessor temperature in accordance with the register value; and

a comparator, wherein the comparator is to generate the first interrupt signal in response to a difference between the output voltage and the bandgap reference voltage indicating that the threshold temperature has been exceeded.

41. (Currently Amended) [[A]] The microprocessor ~~comprising:~~ according to claim 40,

~~a register to store a register value corresponding to a threshold temperature;~~

~~a programmable thermal sensor to receive the register value, wherein the programmable thermal sensor is to generate a first interrupt signal in response to a microprocessor temperature exceeding the threshold temperature corresponding to the register value;~~

~~clock circuitry to provide a clock signal for the microprocessor; and~~

~~a processor unit coupled to the clock circuitry, wherein the processor unit is to execute instructions to vary the frequency of the clock signal in response to the first interrupt signal;~~

wherein the programmable circuitry further comprises

a transistor coupled to the current source to provide the output voltage, a gain ratio of the output voltage to a junction voltage of the transistor to be controlled by a transistor bias, wherein the junction voltage is to vary in accordance with a junction temperature of the transistor, the junction temperature is to correspond to the microprocessor temperature; and

a bias circuit to provide the transistor bias to control the gain ratio, wherein the output voltage is to vary with the microprocessor temperature in accordance with the register value.

42. (Currently Amended) [[A]] The microprocessor ~~comprising:~~ according to claim 41, ~~a register is to store a register value corresponding to a threshold temperature;~~

~~a programmable thermal sensor is to receive the register value, wherein the programmable thermal sensor is to generate a first interrupt signal in response to a~~

~~microprocessor temperature exceeding the threshold temperature corresponding to the register value;~~

~~clock circuitry to provide a clock signal for the microprocessor; and~~

~~a processor unit coupled to the clock circuitry, wherein the processor unit is to execute instructions to vary the frequency of the clock signal in response to the first interrupt signal;~~

wherein the bias circuit further comprises binary weighted resistors.

43. (Cancelled)

44. (Previously Presented) The computer system of claim 48, wherein the active cooling device comprises a fan.

45. (Previously Presented) The computer system of claim 44 further comprising:

clock circuitry to provide a clock signal for the microprocessor, wherein a frequency of the clock signal is reduced in response to the first interrupt signal.

46. (Currently Amended) [[A]] The computer system ~~comprising:~~ according to claim 45,

~~an active cooling device;~~

~~a microprocessor comprising:~~

~~a register to store a register value corresponding to a threshold temperature;~~

~~a programmable thermal sensor to receive the register value, wherein the programmable thermal sensor is to generate a first interrupt signal in response to a microprocessor temperature exceeding the threshold temperature,~~

wherein the active cooling device is to be activated in response to the interrupt signal, and the clock circuitry further comprises

a first clock;

a frequency divider coupled to the first clock to provide the clock signal, the frequency divider to reduce a frequency of the clock signal in response to the interrupt signal; and

a second clock circuit coupled to provide the clock signal to the microprocessor.

47. (Previously Presented) A computer system comprising:

an active cooling device;

a microprocessor comprising:

a register to store a register value corresponding to a threshold temperature;

a programmable thermal sensor to receive the register value, wherein the programmable thermal sensor is to generate a first interrupt signal in response to a microprocessor temperature exceeding the threshold temperature,

wherein the active cooling device is to be activated in response to the interrupt signal, and

the microprocessor further comprises

a processor unit coupled to the second clock circuit, wherein the processor unit is to execute instructions to vary the frequency of the clock signal from the second clock circuit in response to the first interrupt signal.

48. (Currently Amended) [[A]] The computer system ~~comprising:~~ according to claim 47,

~~an active cooling device;~~

~~a microprocessor comprising:~~

~~a register to store a register value corresponding to a threshold temperature;~~

~~a programmable thermal sensor to receive the register value, wherein the programmable thermal sensor is to generate a first interrupt signal in response to a microprocessor temperature exceeding the threshold temperature,~~

wherein the active cooling device is to be activated in response to the interrupt signal, and the processor unit is to program the register with another register value corresponding to another threshold temperature in response to the first interrupt signal.

49. (Cancelled)

50. (Previously Presented) A microprocessor-implemented method of controlling the temperature of a microprocessor, comprising:

a) generating a temperature signal within the microprocessor indicative of the temperature of the microprocessor;

b) comparing the temperature signal with a first threshold temperature level within the microprocessor;

c) generating an interrupt signal in response to the temperature signal indicating that the first threshold temperature level has been exceeded;

d) decreasing a microprocessor clock frequency in response to the interrupt signal;

e) comparing the temperature signal with a second threshold temperature level, wherein the second threshold temperature level represents a fail-safe temperature; and

f) halting the microprocessor, in response to the temperature signal indicating that the second threshold temperature level has been exceeded.

51. (Cancelled)

52. (Previously Presented) A microprocessor-implemented method of controlling the temperature of a microprocessor, comprising:

a) generating a temperature signal within the microprocessor corresponding to the temperature of the microprocessor;

b) comparing the temperature signal with a first threshold temperature level within the microprocessor;

c) generating an interrupt signal in response to the temperature signal indicating that the first threshold temperature level has been exceeded; and

d) activating an active cooling device to decrease the microprocessor temperature in response to the interrupt signal;

wherein the active cooling device is a fan.

53. (Previously Presented) A microprocessor-implemented method of controlling the temperature of a microprocessor, comprising:

a) generating a temperature signal within the microprocessor corresponding to the temperature of the microprocessor;

b) comparing the temperature signal with a first threshold temperature level within the microprocessor;

c) generating an interrupt signal in response to the temperature signal indicating that the first threshold temperature level has been exceeded;

d) activating an active cooling device to decrease the microprocessor temperature in response to the interrupt signal;

e) comparing the temperature signal with a second threshold temperature level, wherein the second threshold temperature level represents a fail-safe temperature; and

f) halting the microprocessor, in response to the temperature signal indicating that the second threshold temperature level has been exceeded.

54-60. (Canceled)